Individual Capstone Assessment

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Introduction

Our senior design project, **Nutriflow**, is a platform designed to deliver intelligent nutrition insights and smarter grocery planning. From my academic perspective as a Computer Science major, this project represents an opportunity to combine concepts from data engineering, artificial intelligence, and human-centric design. The system will collect nutritional data, integrate grocery store information, and provide actionable recommendations to users in an accessible interface. This aligns with the growing demand for technology-driven health solutions and directly reflects the interdisciplinary nature of computer science. By leveraging the skills developed through my coursework and co-op experiences, I will contribute to the backend, data analysis, and recommendation system development.

College Curriculum

My computer science curriculum has given me the technical foundation needed to contribute effectively to this project. Courses such as **CS2028 Data Structures** provided me with strong problem-solving strategies for optimizing search and recommendation features. **CS4092 Database Design and Development** taught me how to design relational schemas and query efficiently, which will be essential for handling the large-scale nutritional and pricing data Nutriflow will use. In **CS4033 Artificial Intelligence**, I learned about machine learning algorithms and reasoning systems that directly apply to building a recommendation engine for personalized meal planning. Additionally, **EECE3093 Software Engineering** emphasized teamwork, requirements gathering, and iterative design, which will guide our project structure. These courses have developed both technical expertise and collaborative skills that I will apply to Nutriflow's architecture.

Co-op Experiences

My co-op experiences have also prepared me for this project by providing real-world technical and professional skills. At **Physna, Inc.**, as a Contract Software Engineer, I worked with Python, PyTorch, and VR/AR development, where I gained practical experience building AI-driven tools and integrating

them into production environments. My previous co-op at **Pieces for Developers** exposed me to full-stack integration engineering, DevOps, and cloud platforms, which will help in deploying Nutriflow's services reliably. Earlier experiences at **Physna** as a Software Engineer Intern involved designing test automation pipelines and integrating generative AI into applications, skills that map directly to Nutriflow's automation and recommendation components. These roles taught me technical adaptability, problem-solving under deadlines, and cross-team communication - non-technical skills just as important as coding when building a large collaborative system.

Motivation

I am motivated to work on Nutriflow because it combines my interest in technology with a meaningful social impact: helping people eat healthier while saving money and reducing waste. This project is exciting because it is not just a technical challenge but also an opportunity to create a solution that touches daily life in a positive way. I am passionate about building systems that go beyond abstract computation and directly improve quality of life. The intersection of AI, nutrition, and affordability feels timely and relevant, especially given rising grocery costs and increased awareness of healthy living. Knowing that our work could lead to a real-world application that benefits communities is a strong motivating factor for me.

Preliminary Approach

My preliminary approach to Nutriflow will focus on modular design, beginning with reliable data pipelines for scraping and aggregating nutritional information. Once the data foundation is in place, I will contribute to developing machine learning models for personalized recommendations and a scalable backend to support them. I expect our results to demonstrate cost savings, accurate meal suggestions, and measurable reductions in food waste. To evaluate my contributions, I will track progress against both technical milestones (e.g., functional API endpoints, accuracy of recommendation algorithms) and user-facing outcomes (e.g., clear, actionable dashboards). I'll know I have done a good job when my work contributes to a seamless user experience, integrates successfully with other components, and supports the team's broader vision of creating an intelligent food ecosystem.